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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,106	05/05/2005	Kunihiro Ichimura	OPC-C511	7016

7590 01/24/2008

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EXAMINER	
JOHNSON, CONNIE P	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
01/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,106	ICHIMURA ET AL.	
	Examiner	Art Unit	
	Connie P. Johnson	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-26,28,29 and 31-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-26,28,29 and 31-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The remarks and amendment filed 11/15/2007 have been entered and fully considered.

2. Claims 15-26, 28-29 and 31-36 are presented.

3. Claim 30 is cancelled.

4. Claim 36 is new.

5. Claim 15 is amended.

Claim Rejections - 35 USC § 103

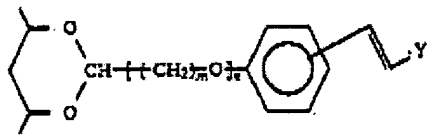
6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 15-24, 26, 28-29 and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichimura et al., U.S. Patent No. 4,777,114 in view of Keane et al., U.S. Patent No. 4,341,859.

Ichimura teaches a photosensitive resin emulsion comprising a film-forming resin and a protective colloid (abstract). The photosensitive resin emulsion comprises a photosensitive unit and a saponified polyvinyl acetate derivative with a hydrophobic unit bonded to the backbone (col. 2, lines 57-67). The photosensitive unit comprises a

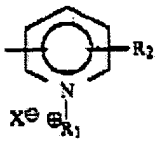
polyvinyl alcohol and styrylpyridinium group as in instant claim 22 (see column 3, figure 1).



(I)

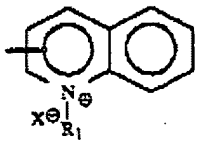
wherein

stands for a vinyl alcohol unit residue of the saponified polyvinyl acetate in the backbone, Y stands for a group represented by the following formula (II) or (III):



(II)

or



(III)

The polyvinyl acetate in the backbone comprises a vinyloxy group. Examples of the styrylpyridium compounds include N-methyl-4-(p-formyl-styryl)pyridium methosulfate (col. 7, lines 7-18). The film-forming polymer is a water-soluble polymer that may comprise such polymers as acrylic/acrylic acid copolymer and styrene polymer (col. 7, lines 31-45). Ichimura also teaches a method of forming a pattern. The method

comprises preparing a resin emulsion composition and coating the film on a screen printing plate. The composition is heated to 60^0C and stirred overnight prior to coating on the screen printing plate. The composition was dried and irradiated with light. After exposure, the composition was developed with water (see example 1, column 8). The water used in development is neutral water and therefore has a pH of 7.0. Ichimura does teach a photosensitive composition. Further, the reaction between the polyvinyl alcohol and the styrylpyridium salt compound is a photocrosslinking reaction. Ichimura does not teach an acid former and sensitizer in the photosensitive composition.

However, Keane teaches a resist film comprising an emulsion composition. The emulsion composition is developable by water alone (see abstract). The emulsion is prepared with polyvinyl alcohol (water-soluble), a catalyst and an insolubilizing crosslinking agent (col. 3, lines 48-67). The catalyst is representative of a photoacid generator and is present in the form of a fine powder (col. 4, lines 64-67). Keane also teaches a sensitizer in the emulsion (col. 5, lines 1-5). Keane does not specifically teach that the sensitizer is in the form of particles. However, it would have been obvious to one of ordinary skill in the art that the sensitizer is in the form of particles because Keane teaches that the sensitizer is dispersed in the emulsion. Further, it would have been obvious to one of ordinary skill in the art to use the catalyst and sensitizer of Keane in the emulsion of Ichimura because the catalyst accelerates the crosslinking reaction and the sensitizer promotes the action of the catalyst as taught by Keane (col. 3, lines 65-68 and col. 5, line 3).

8. Claims 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichimura et al., U.S. Patent No. 4,777,114 in view of Keane et al., U.S. Patent No. 4,341,859 in view of Kawamura et al., U.S. Patent No. 6,465,146 B1 and further in view of Zampini, U.S. Patent No. 6,645,695 B2.

Ichimura teaches a photosensitive resin emulsion comprising a film-forming resin and a protective colloid (abstract). The photosensitive resin emulsion comprises a photosensitive unit and a saponified polyvinyl acetate derivative with a hydrophobic unit bonded to the backbone (col. 2, lines 57-67). The photosensitive unit comprises a polyvinyl alcohol and styrylpyridinium group as in instant claim 22. The combination of Ichimura and Keane teaches a sensitizer and a photoacid generator in the form of particles in the composition. Ichimura nor Keane teach that the sensitizer and photoacid generator particles have a particle size of 1.5μm or less.

However, Kawamura teaches a radiation-sensitive composition comprising pigment particles (sensitizer) with a particle diameter of 0.01 to 10 μm (col. 8, lines 53-55). The particle size of the pigment particles is advantagous to the uniformity of the dispersion in the sensitive layer. Kawamura also teaches a photoacid generator in the composition. It would have been obvious to one of ordinary skill in the art to use a particle size of 0.01 to 10 μm for the sensitizer of Ichimura to stabilize and provide uniformity in the sensitive layer as taught by Kawamura.

Further, Zampini teaches a photoresist composition comprising polymer and photoacid generator particles encapsulated as core-shell material in the photoresist (col.

12, lines 5-11). The particle size of the polymer particles are 1 to 1000nm (col. 12, line 64). Since the photoacid generator particles are combined with the polymer particles, it is expected that the photoacid generator particles also have a particle size of 1 to 1000nm. Zampini also teaches that the photoacid generator particles are preferably added to the polymer particles to improve surface modification of the particles during by crosslinking or other functionality on the polymer surface (col. 12, lines 12-24). It would have been obvious to one of ordinary skill in the art to use the photoacid generator particles with a particle size of 1 to 1000nm in the composition of Kawamura to improve surface modification ability of the encapsulated particles in the photoresist composition as taught by Zampini.

Response to Arguments

9. Applicant's arguments, filed 11/15/2007 with respect to the rejection(s) of claim(s) 15-19, 24 and 26 under 103(a), claim 15 under 103(a), claims 15, 20, 21, 22, 23, 25-29, 33 and 35 under 103(a) and claims 15, 25, 30-32 and 34 under 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new ground(s) of rejection are made herein.

10. Applicant argues that Kawamura does not teach or suggest an acid-reactive insolubilizing agent.

The 103(a) rejection over the Kawamura reference has been withdrawn, therefore the arguments are moot. Kawamura is used to show particle size of the

sensitizer particles while Zampini is used to show photoacid generator particles in the new 103(a) rejection.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Connie P. Johnson whose telephone number is 571-272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Connie P. Johnson
Examiner
Art Unit 1752

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700